dynafor™ HHD

Installation, operating and maintenance manual — English Original manual GB

Manuel d'installation d'emploi et d'entretien — Français Traduction de la notice originale FR

Installations-, Gebrauchs- und Wartungsanleitung — Deutsch Übersetzung der Originalanleitung DE

Handleiding voor installatie, gebruik en onderhoud — Nederlands Vertaling van de oorspronkelijke handleiding NL

Manual de instalación, de utilización y de mantenimiento — Español Traducción del manual original ES

Manuale d'installazione, d'impiego e di manutenzione — Italiano Traduzione del manuale originale IT

Manual de instalação, de uso e de manutenção — Português Tradução do manual original PT

GB *Electronic handheld display dynafor™ HHD*

FR *Afficheur déporté électronique dynafor™ HHD*

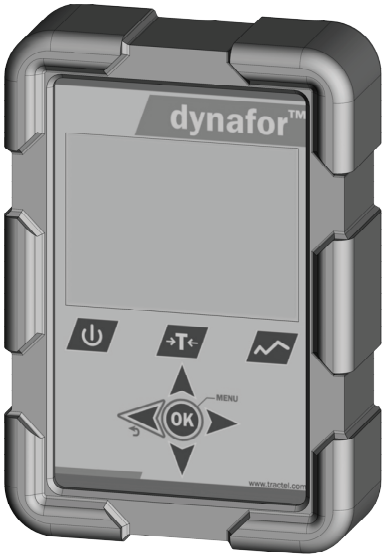
DE *Tragbares elektronisches Display dynafor™ HHD*

NL *Elektronisch draagbaar display dynafor™ HHD*

ES *Pantalla de mano electrónica dynafor™ HHD*

IT *Display elettronico portatile dynafor™ HHD*

PT *Unidade de exibição portátil eletrónica dynafor™ HHD*



Figure, Abbildung, Figuur, Figura, Φιγούρα, Figur, Kuva, Figur, Rysunek, Рисунок

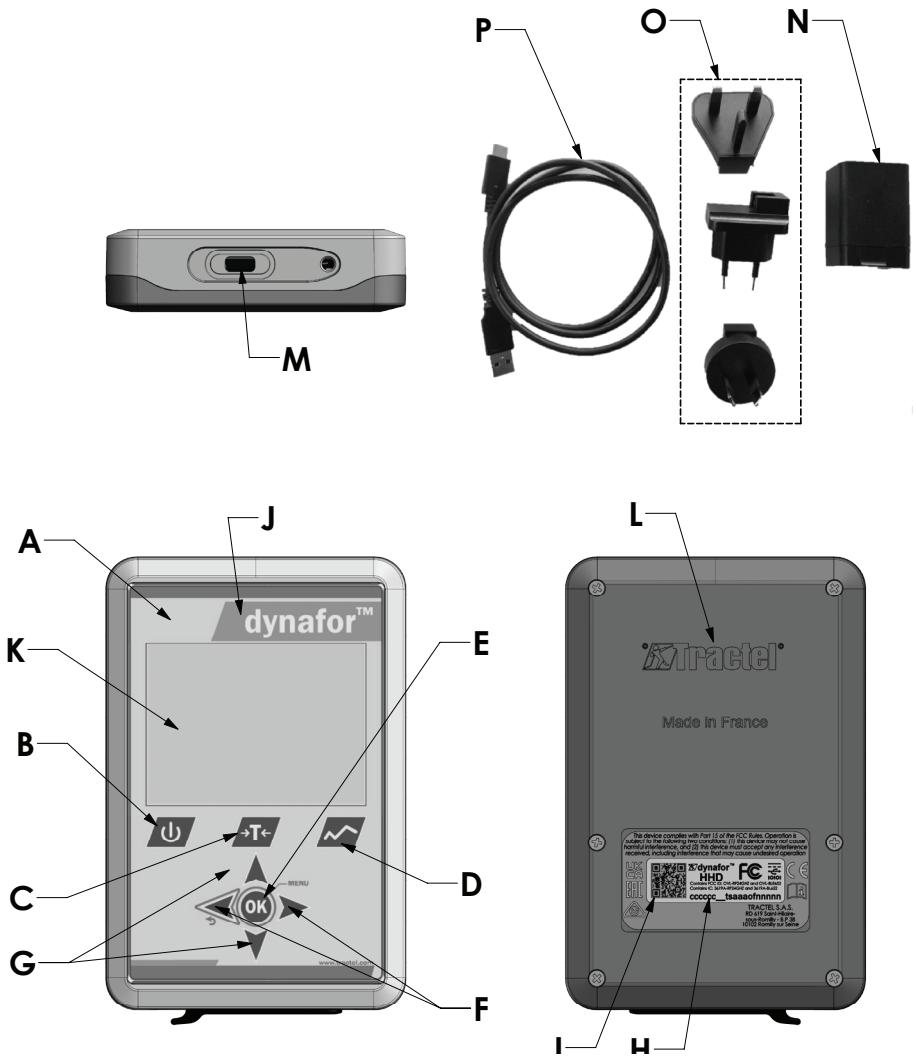


Fig. 1

Fig. 2

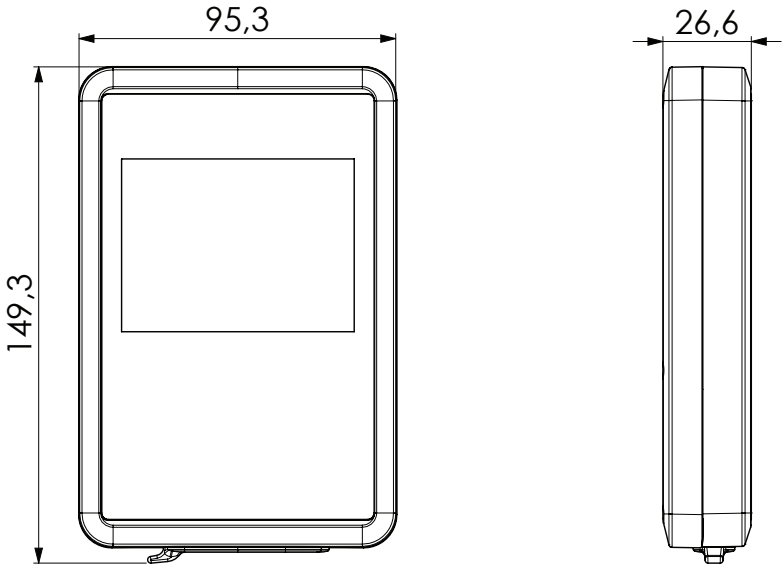


Fig. 3

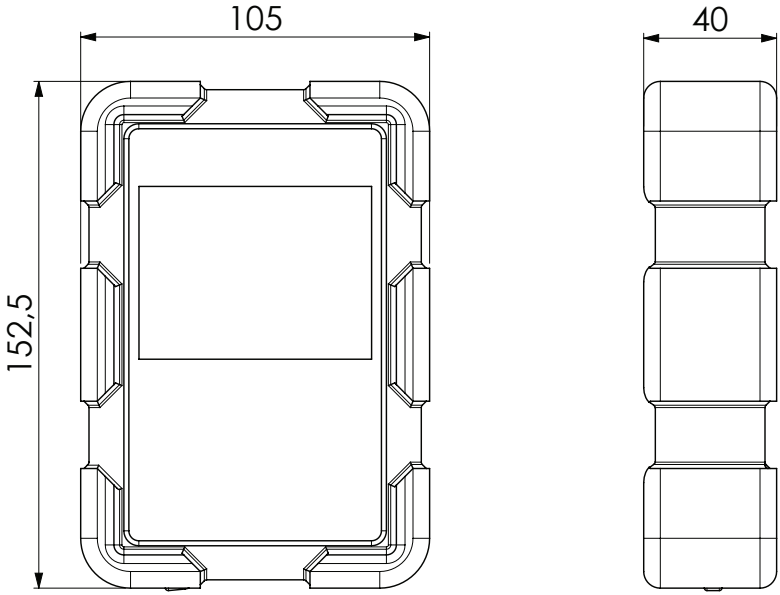


Fig. 4

Contents

GB

1. Priority instructions

1. Before installing and using this device, it is essential that you read these instructions and comply with its instructions for safe and effective use. A copy of these instructions must be made available to all operators. Additional copies can be obtained upon request from Tractel®.
2. Do not use this device if any of the labels affixed to the device or any of its accessories, or any of the markings on it as shown at the end of this manual are no longer present or legible. Identical labels can be obtained upon request from Tractel® and must be affixed before continuing to use this device.
3. Make sure that any operator of this device is familiar with its operation and capable of applying the safety requirements for the task to be performed. These instructions must be made available to these operators. Protect your equipment from uncontrolled intervention.
4. This device must be installed and put into operation in conditions that ensure the safety of the installer in accordance with applicable local regulations.
5. Every time the device is used, first inspect its condition and that of any accessories used with the device. Never use a device that does not appear to be in good condition.
6. Return the device to the manufacturer for servicing if there are any visible or operating problems unrelated to the battery condition.
7. Protect the device from any shocks, especially on the display device.
8. This device may never be used for operations other than those described in these instructions. It may never be used in an explosive atmosphere.
9. Any modification of this device without the approval of Tractel® or any removal of any component shall release Tractel® from any liability.
10. Any disassembly of this device not described in these instructions or any repair work not approved by Tractel® shall release Tractel® from any liability,

especially if original parts are replaced by parts from another source.

11. When the device is finally withdrawn from service, it must be scrapped in such a way that it cannot be used again. Comply with environmental protection regulations.
12. This device is approved according to European regulations and the standards specified in the section “11. Regulations and standards”, and must be verified for compliance with the regulations of any other country in which it may be used, prior to commissioning and use. Comply with such regulations.
13. Any use of this device with additional equipment that relays its signals to an operating system must be preceded by a risk assessment specific to the operating functions used and all appropriate measures must be taken accordingly.
14. The power supply to the display box serves as a disconnect switch and must always remain accessible.

2. Definitions and pictograms

2.1. Definitions

In this manual, the following terms have the meaning given below:

“Product”: Item or equipment described in this manual and delivered complete in the standard version, or in its various existing models.

“Installation”: All the operations required to bring the complete product from the state in which it was delivered into a state of commissioning (or connection to other elements for commissioning).

“Supervisor”: Individual or party responsible for the management and safe use of the product described in the manual.

“Technician”: Qualified person familiar with the product, in charge of the maintenance operations described and permitted in the manual.

“Operator”: Individual using the product in accordance with the instructions in this manual.

“MR”: Measurement Range (full scale).

“SWL”: Safe Working Load.

“Sensor”: Component or assembly measuring a load. It can be a dynafor™ Pro, Expert or an assembly comprising a dynafor™ Transmitter WL and its electronic sensor.

2.2. Pictograms

“DANGER”: When placed at the beginning of a paragraph, it indicates instructions for preventing injuries ranging from minor to fatal and also environmental damage.

“IMPORTANT”: When placed at the beginning of a paragraph, it indicates instructions for preventing product failure or damage which would not directly endanger the life or health of operators or other individuals and/or which may harm the environment.

“NB”: When placed at the beginning of a paragraph, it indicates the necessary precautions to apply for efficient and ergonomic installation, use and maintenance.

: When placed on the product itself or a product component, it indicates the need to read the operating and maintenance manual.

3. Description and markings

3.1. Presentation

The dynafor™ HHD is a portable colour display device which is designed to receive, process and display the signals from one or more of the dynafor™ Pro, Expert or Transmitter WL sensors.

The link between the two components (sensor and dynafor™ HHD) is based on a 2.4 GHz frequency band.

The equipment is delivered in a box containing:

- The dynafor™ HHD;
- Its mains charger and a USB C to USB A cable;
- Its installation, operating and maintenance manual;
- Its CE declaration of conformity.

The technologies implemented at the levels of radio and software offer, in addition to traditional uses expected of a hand held device of a professional dynamometer (load display, tare, peak load, etc.) multiple configuration possibilities that combine one or more sensors. They also provide access to advanced functions such as saving, threshold management and monitoring in real time.

The option of a PC link via a USB port opens the door to data management and archiving.

The different possible combinations are described in chapter 4. Equipements associés.

3.2. Operating principle

The operating principle of the dynafor™ HHD is based on the analysis and processing of the measurement, transmitted by radio waves from the associated sensor.

The dynafor™ HHD then immediately indicates the load applied to the sensor(s) associated with it.

3.3. Markings

A	Front panel
B	ON/OFF button
C	Tare button
D	Peak load button
E	OK button
F	Left and right arrow buttons
G	Up and down arrow buttons
H	Serial number
I	QR code
J	Product brand
K	LCD screen
L	Name of manufacturer
M	USB connector
N	Charger unit MK-PQ181EU 100-240 V ~50/60 Hz 0.5 A Max
O	EU, UK, US plugs
P	USB cable, type C to A

4. Associated equipment

The product is compatible with the following equipment:

Sensors:

- dynafor™ Pro, offering 0.2% (MR) precision, and a capacity range from 1 to 250 t

Dynafor™	Code
Pro 1t	293369
Pro 3.2t	293379
Pro 6.5t	293389
Pro 15t	293399
Pro 25t	293409
Pro 50t	293419
Pro 100t	293429
Pro 250t	293439

- dynafor™ Expert, offering 0.1% (MR) precision, and a capacity range from 0.5 to 10 t

Dynafor™	Code
Expert 0.5t	293299
Expert 1t	293309
Expert 2t	293319
Expert 3.2t	293329
Expert 5t	293339
Expert 6.3t	293349
Expert 10t	293359

- Electronic sensor paired with a dynafor™ Transmitter WL, allowing any electronic sensor with mV/V output to be interfaced with the Tractel® range of accessories.

Other display devices:

- Additional dynafor™ HHD hand held device for displaying the measurement on several devices.
  Code: 293609 when purchased simultaneously with a dynafor™ Expert or Pro sensor
  Code: 293449 when purchased separately
- AL128 large display unit for high visibility, 128 mm high digits with wireless communication up to 200 m.
  Code: 293489

Threshold safety management module:

- dynafor™ monitoring unit (DMU) offering the same functionalities as the dynafor™ HHD hand held device and allowing up to 5 relays to be controlled.
  Code: 293479

Software:

- Loader software for downloading the data saved on the dynafor™ HHD to a computer.
  Code: 293509
- Monitoring software allows values to be displayed, saved and analysed live for up to 8 sensors. Requires the dynafor™ HHD hand held device.
  Code: 68968

5. Use

⚠ The supervisor must ensure that the operator has reviewed this installation, operation and maintenance manual before they use the device.

5.1. Battery

The 3.7 V rechargeable battery is factory-fitted.

Fully charge the battery before using the product for the first time.

Use the charger supplied with the dynafor™ HHD for any recharging (fully recharged in 3 h).

The battery can only be changed by Tractel® or an authorised repairer.

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5.2. Installation of the associated sensor(s)

During installation, it is imperative to follow the recommendations mentioned in the installation, operation and maintenance manuals of the sensors.

5.3. Starting up the sensor

Always switch on the sensor(s) before switching on the hand held device, otherwise the hand held device will not be able to establish the radio link.

See the sensor manual for information on starting it up.

When the power is turned on, the two red LEDs start to flash simultaneously.

5.4. Starting up the product

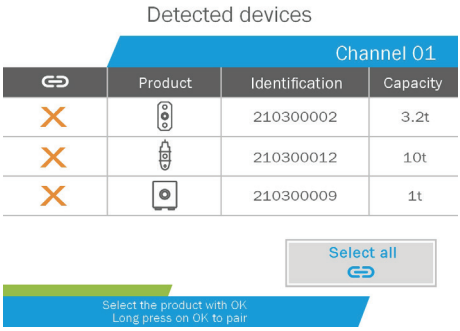
The dynafor™ HHD hand held device is started up by pressing and holding (for three seconds) the ON/OFF button on the front panel (see figure 2), until the home screen appears.

5.5. Function

5.5.1. First use

NB: The multiple configuration consists in connecting up to four sensors. The sensors can have different capacities. (For more than four sensors, the PC Monitoring Software connection option is required.)

When the product is switched on, it automatically searches for sensors in its environment, on a defined channel. If the channel is already occupied, it is automatically incremented. Up to 10 channels, and therefore 10 configurations, are available. The search time for the devices is one minute. Once the search is complete, the product switches to the next screen:



The navigation is done by using the up and down arrow buttons. (See figure 1.) Sensors that are not paired are ticked red by default.

Pressing the OK button (see figure 1) selects the sensor for pairing. The tick will then turn green.

All sensors can be selected by pressing “Select all”.

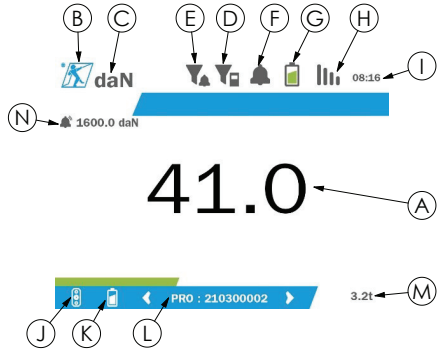
After selecting them all, holding down the “OK” button starts the pairing of the sensors.

The pairing of a sensor is confirmed when the two LEDs on the front of the sensor are activated for three continuous seconds.

Once the sensor(s) have been paired, the product automatically switches to the main display.

To return to this screen for further pairings, see chapter 5.5.11.1.

5.5.2. Single-sensor main display



A	Measurement
B	Tractel logo
C	Unit of measurement
D	Measurement filter (see 5.5.8.2)
E	Threshold trip filter (see 5.5.8.2)
F	Built-in buzzer (see 5.5.12)
G	Product battery indicator
H	Status of the connection to the sensor
I	Time
J	Sensor logo (differentiated according to the dynafor™ Pro, Expert and Transmitter WL models)
K	Sensor batteries indicator

L	Identification of sensor (designation + last nine digits in serial number)
M	Sensor capacity in t
N	Values of set thresholds (see 5.5.12)

In the case of multiple sensors, the change of page is done by pressing the right or left button. (See figure 1.) The markers H, J, K, L, M and N are updated with the new sensor information.

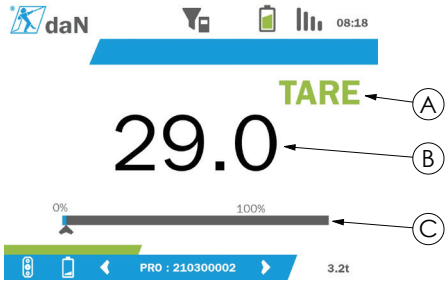
5.5.3. Tare function

The tare function is used to indicate the net force of the load.

The tare function allows the value displayed on the product to be reset to zero. This function is activated by pressing the tare button (item C, fig. 1) for two seconds.

It is then possible to apply a force and display its net value.

Pressing the tare button changes from a net to a gross value.



A	TARE indicator
B	Net measurement if TARE reference present Gross measurement if TARE reference present
C	Actual load display bar

The display bar C changes according to the actual gross load. Indicator A indicates that tare mode has been activated.

When the SWL of the sensor is exceeded (100%), the display bar turns red.

If the SWL is exceeded by more than 10%, an overload message appears (See 5.5.13.)

NB: When the tare function is activated, decreasing the force may cause the display to turn negative as the case may be.

NB: In the case of multiple sensors, the page is changed by pressing the left or right button. It is possible to apply one tare per sensor.

NB: The peak load function is not available when the tare function is activated.

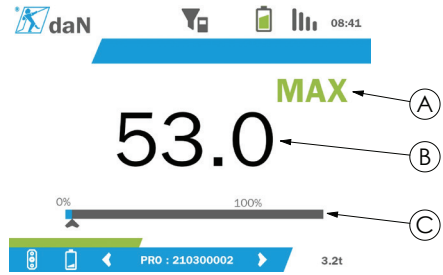
5.5.4. Peak load function

The peak load function is used to store the maximum value reached when the force is applied.

To activate this function, press the peak load button (item D, fig. 1). The sensors LED start to flash at a frequency of 2 Hz. The measurement frequency reaches 32 Hz.

The value displayed is the maximum applied force.

To deactivate this function, press the peak load button again (item D, fig. 1).



A	“MAX” indicator
B	Maximum measurement
C	Actual load display bar

The display bar C changes according to the actual gross load. Indicator A indicates that peak load mode has been activated.

When the SWL of the sensor is exceeded, the display bar turns red.

If the SWL is exceeded by more than 10%, an overload message appears. (See 5.5.13.)

NB: In the case of multiple sensors, the page is changed by pressing the left or right button. It is possible to apply one peak load per sensor.

NB: The tare function is not available when the peak load function is activated.

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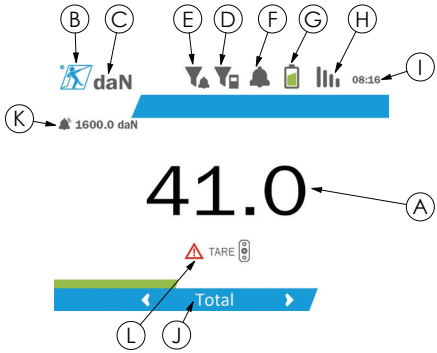
5.5.5. Multi-sensor main displays

NB: The measurement shown on the multi-sensor display depends on the individual values. If a tare is performed on a sensor, it is reflected in the display of the total value. A warning message warns the user. The peak load function is not taken into account in the display (actual value is maintained).

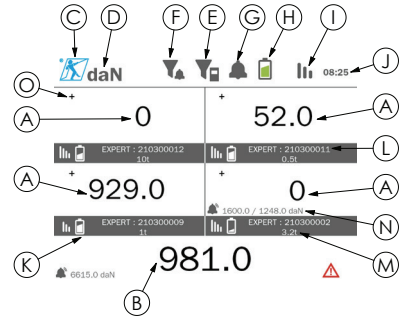
When used with several sensors, two additional displays are available to display the forces. These screens are accessible by pressing the left and right buttons.



A	Measurement
B	Tractel logo
C	Unit of measurement
D	Measurement filter (see 5.5.8.2)
E	Threshold trip filter (see 5.5.8.2)
F	Built-in buzzer (see 5.5.12)
G	Product battery indicator
H	Status of the connection to the sensor the furthest away
I	Time
J	Identification of the sensor assembly
K	Values of set thresholds (see 5.5.12)
L	Warning message in case of a tare performed in an individual sensor

NB: The tare and peak load functions are available in exactly the same way as a single sensor. The peak load function switches all the sensors to peak load mode.

The second multi-sensor screen shows the values of the sensors individually, as well as the total. The display is dynamic and can contain up to four sensors.



A	Individual measurements of the sensors
B	Display of the total of the individual measurements
C	Tractel logo
D	Unit of measurement
E	Measurement filter (see 5.5.8.2)
F	Threshold trip filter (see 5.5.8.2)
G	Built-in buzzer (see 5.5.12)
H	Product battery indicator
I	Status of the connection to the sensor the furthest away
J	Time
K	Sensor batteries indicator
L	Identification of sensor (designation + last nine digits in serial number)
M	Sensor capacity in t
N	Values of set thresholds (see 5.5.12)
O	Measurement sign (null, positive or negative)

The screen can be navigated with the arrow buttons. The selected sensor is highlighted.

The tare and peak load functions are accessible by pressing the corresponding buttons when a sensor is highlighted. It is not possible to activate the two modes simultaneously. These modes apply to the total if no sensor is selected.

NB: The display bars are not visible on this screen.

Pressing the “OK” button briefly changes the measurement sign.

Holding down (for two seconds) the “OK” button on a selected sensor takes you to the associated single-sensor screen.

Holding down (for one second) the left button deselects the sensor.

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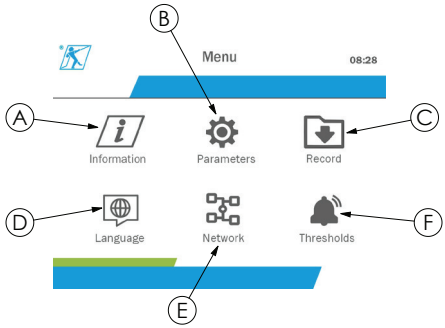
5.5.6. Main menu

The main menu is entered by holding down (for two seconds) the “OK” button (item E, fig. 1)



A	Information menu (see 5.5.7)
B	Parameters menu (see 5.5.8)
C	Recording menu (see 5.5.9)
D	Language menu (see 5.5.10)
E	Network menu (see 5.5.11)
F	Thresholds menu (see 5.5.12)

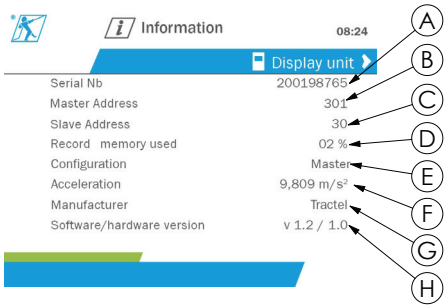
To return to the main display, hold down (for one second) the left button.

5.5.7. Information menu

The “Information” screen is entered by pressing the “OK” button briefly (item E, fig. 1) when the “Information” icon is highlighted from the main menu.

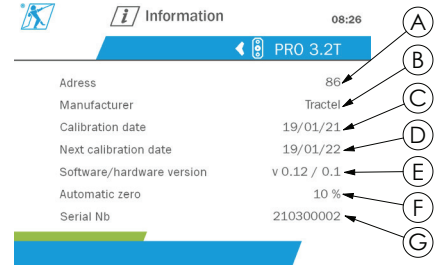
Various items of information about the hand held display and the paired sensors are available. The screen is navigated by pressing the left and right buttons.

Display unit information:



A	Product serial number
B	Master radio address
C	Slave radio address
D	Memory used for saving
E	Slave or master configuration mode
F	Acceleration value
G	Manufacturer
H	Software and hardware versions of the display unit

Sensor information:

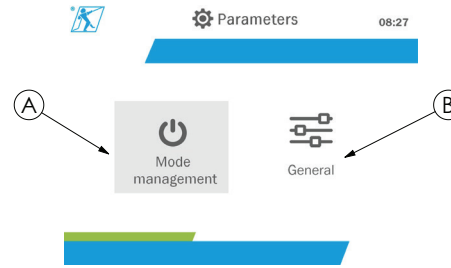


A	Sensor radio address
B	Manufacturer
C	Date of latest calibration
D	Date of next recommended calibration
E	Software and hardware versions of the sensor
F	Automatic zero value
G	Sensor serial number

To return to the main menu, hold down (for one second) the left button.

5.5.8. Parameters menu

The “Parameters” screen is entered by pressing the “OK” button briefly (item E, fig. 1) when the “Parameters” icon is highlighted from the main menu.



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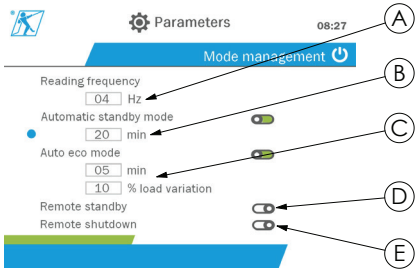
A	“Mode management” sub-menu (see section5.5.8.1)
B	“General” sub-menu (see section 5.5.8.2)

To return to the main menu, hold down (for one second) the left button.

5.5.8.1. Mode management sub-menu

The “Mode management” sub-menu is entered by pressing the “OK” button briefly (item E, fig. 1) when the “Mode management” icon is highlighted.



A	Reading frequency, adjustable from 1 to 4 Hz
B	Automatic sleep mode setting
C	Automatic power-saving mode setting
D	Remote sensor sleep
E	Remote sensor shutdown

The navigation in the sub-menu is done by using the up and down buttons. The round, blue indicator updates according to the position.

The fields are set by pressing the “OK” button then the up and down buttons. The values are validated by pressing the “OK” button briefly.

The modes are activated/deactivated by pressing the “OK” button briefly.

NB: The factory default for automatic sleep and power-saving modes are active (20 min and 5 min/10% respectively).

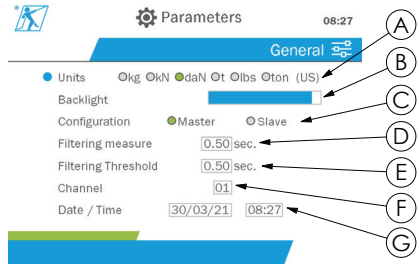
NB: The power-saving mode is activated after no load change for a period of time, in order to preserve the sensor batteries. The reading frequency of the sensor switches to 1 Hz. A change in load causes the sensor to switch back on as normal (measuring frequency 4 Hz).

NB: The automatic sleep mode is activated after no load change (10% of the SWL of the sensor). It causes the measurements to stop and preserves the batteries. The sensor returns to normal operation after switching the dynafor™ HHD back on.

To return to the “Parameters” menu, hold down (for one second) the left button. The changes are taken into account when you return to the “Parameters” menu.

5.5.8.2. General sub-menu

The “General” sub-menu is entered by pressing the “OK” button briefly (item E, fig. 1) when the “General” icon is highlighted.



A	Measurement unit setting
B	Backlighting setting
C	Configuration of the master or slave mode (see 5.5.8.2)
D	Measurement filter setting. This filtering enables sliding averaging of the measurements over a fixed period. The factory default setting is 0.5 seconds.
E	Thresholds trip filter setting. This limits the dynamic effects on a threshold trip. The factory default setting is 0 second. This filtering is not used in connection with the use of this product.
F	Radio communication channel configuration.
G	Date and time setting

The navigation in the sub-menu is done by using the up and down buttons. The round, blue indicator updates according to the position.

The units and configuration mode are set by pressing the left and right buttons.

The other fields are set by pressing the “OK” button then the up and down buttons. The values are validated by pressing the “OK” button briefly.

NB: Changing the channel causes the loss of the paired sensors. Ten channels are available, allowing several configurations.

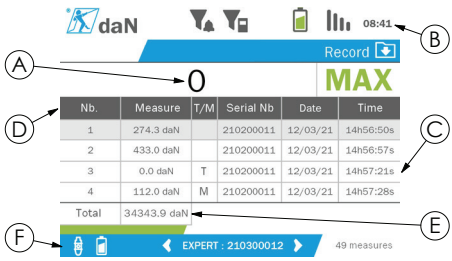
NB: Before changing from master to slave mode, see chapter 5.5.18.

To return to the “Parameters” menu, hold down (for one second) the left button.

5.5.9. Recording menu

NB: A measurement can be saved and the accumulation calculated only if no lines are selected.

The “Recording” menu is entered by pressing the “OK” button briefly (item E, fig. 1) when the “Recording” icon is highlighted.



A	Sensor measurement
B	Top banner, containing the information described in 5.5.2
C	Recording table
D	Recorded information: • Measurement no. • Measurement on the screen • Nature of the value (T=Net; M=Max; Empty=Gross) • Sensor serial no. • Date and time saved
E	Accumulation of measured values
F	Lower banner, containing the sensor information described in 5.5.2

A measurement is recorded by pressing the “OK” button.

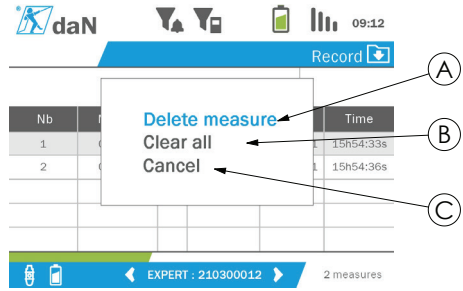
The recorded measurement appears in the table and corresponds to the measurement of the sensor indicated in the lower banner.

The cumulative measurements are updated whenever they are saved.

The navigation between the sensors and their total is done by pressing the left and right buttons. The measurement display and the lower banner are updated according to the selected sensor.

The recorded values can be seen in the table. To do this, enter the table using the up and down buttons. The selected line is highlighted. To leave the table, hold down (for one second) the left button.

Use the up and down buttons to select the measurement to be deleted, then press the “OK” button.



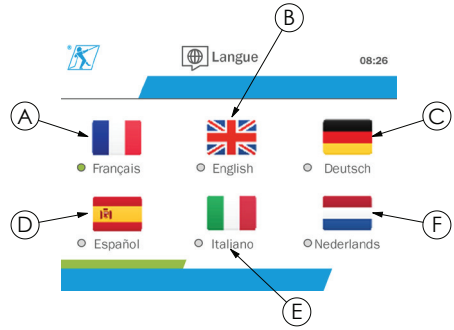
A	Confirm deletion of the selected measurement
B	Confirm deletion of all measurements
C	Cancel deletion and return to the table

NB: The recorded data can be exported for processing. For this, the PC Loader Software option is required.

To return to the main menu, hold down (for one second) the left button.

5.5.10. Language menu

The “Language” screen is entered by pressing the “OK” button briefly (item E, fig. 1) when the “Language” icon is highlighted from the main menu.



A	French
B	English
C	German
D	Spanish
E	Italian
F	Dutch

GB

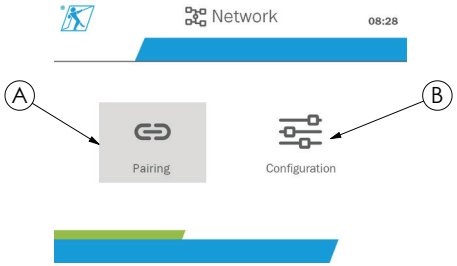
The language is selected by briefly pressing the “OK” button when the wished language is highlighted.

The language is changed automatically and instantaneously after selection. The product then returns to the main menu.

To return to the main menu, hold down (for one second) the left button.

5.5.11. Network menu

The “Network” screen is entered by pressing the “OK” button briefly (item E, fig. 1) when the “Network” icon is highlighted from the main menu.



A	“Pairing” sub-menu (see 5.5.11.1)
B	“Configuration” sub-menu (see 5.5.11.2)

To return to the main menu, hold down (for one second) the left button.

5.5.11.1. Pairing sub-menu

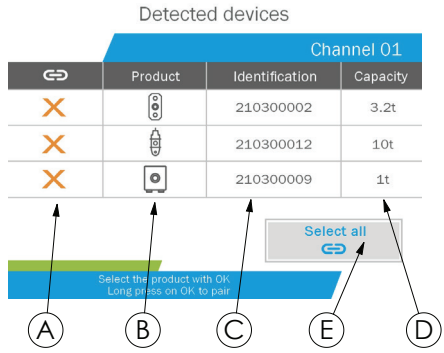
NB: This sub-menu also allows you to pair display devices (dynafor™ HHD) configured in slave mode. (See 5.5.18.)

The “Pairing” sub-menu is entered by pressing the “OK” button briefly (item E, fig. 1) when the “Pairing” icon is highlighted.

The product searches for one minute for devices in its environment. If another master display device is present, the product increments its channel, up to a limit of 10 channels. Beyond that, pairing will not be possible.

NB: It is not possible to pair a sensor already paired and switched on with another display device. It will not appear in the list of sensors.

NB: No more than four sensors and three slave display devices can be paired. For this, the PC option is required.



A	List of sensors or slave devices found
B	Nature of the sensor (dynafor™ Pro, Expert, Transmitter) or display unit (dynafor™ HHD)
C	Identification of equipment (last nine digits in serial number)
D	Sensor capacity in t
E	“Select all” button

The navigation is done by using the up and down arrow buttons. (See figure 1.) Sensors that are not paired are ticked red by default.

Pressing the “OK” button (see figure 1) selects the sensor for pairing. The tick will then turn green.

Pressing the “OK” button of a sensor already paired (green tick) changes the tick to red. The sensor will then be unpaired during the validation stage.

All sensors can be selected by pressing the “OK” button when “Select all” is selected and highlighted.

After selecting them all, holding down the “OK” button starts the pairing of the sensors.

The pairing of a sensor is confirmed when the two LEDs on the front of the sensor are activated for three continuous seconds.

Once the sensor(s) have been paired, the product automatically switches to the main display.

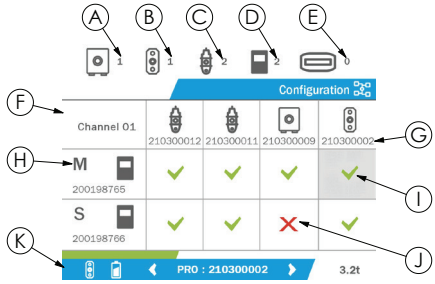
To return to the main menu, hold down (for one second) the left button. In this case, no changes are made to the current configuration.

5.5.11.2. Configuration sub-menu

NB: A sensor is always configured in slave mode. See chapter 5.5.18 for details on pairing other display devices in slave mode.

NB: The configuration is saved if the product is switched off. It is lost in case of modification of the pairing (addition of sensors, replacement, removal).

The “Configuration” sub-menu is entered by pressing the “OK” button briefly (item E, fig. 1) when the “Configuration” icon is highlighted.



A	Number of dynafor™ Transmitter WL models present on the channel.
B	Number of dynafor™ Pro models present on the channel.
C	Number of dynafor™ Expert models present on the channel.
D	Number of dynafor™ HHD or DMU models present on the channel.
E	Number of dynafor™ AL128 models present on the channel. Not used when using this product.
F	Configuration table: • Lines representing the display devices • Columns representing the sensors
G	Identification of equipment (last nine digits in serial number)
H	Master display device reference.
I	Green tick: Sensor displayed on the display device corresponding to its line.
J	Red tick: Sensor not displayed on the display device corresponding to its line.
K	Lower banner showing the selected sensor information (5.5.2).

The table is entered by pressing an arrow button.

The navigation is done by using the left, right, up and down arrow buttons.

Press the “OK” button to change the tick status.

NB: Up to four sensors and four display devices are displayed.

To return to the main menu, hold down (for one second) the left button.

5.5.12. Thresholds menu

NB: The thresholds are saved if the product is switched off, unless the network configuration (addition of sensors, replacement, removal) is modified.

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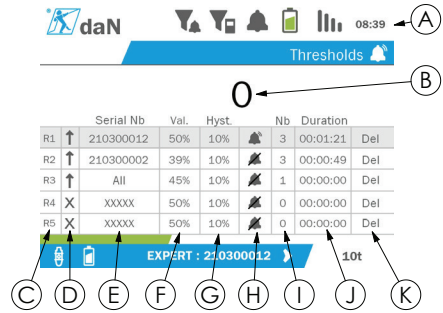
NB: The thresholds are always set to gross values.

The “Thresholds” menu is entered by pressing the “OK” button briefly (item E, fig. 1) when the “Threshold” icon is highlighted from the main menu.



A	Top banner, containing the information described in 5.5.2
B	Instantaneous measurement
C	Threshold number
D	Trip direction (up, down or not active)
E	Sensor serial number for the threshold setting
F	Set threshold value
G	Hysterisis value. This hysteresis corresponds to the load percentage required to deactivate the threshold. Example: threshold set at 500 daN, 10% hysteresis. Exceeded at 500 daN, disengagement at 500 – 10%x500= 450 daN).
H	Activation of the built-in buzzer if the threshold is tripped
I	Number of recorded overruns
J	Duration of the total threshold overrun
K	Delete the set threshold

Up to five thresholds can be configured.

To configure a threshold, select a line with the up and down buttons. Confirm the line selection by pressing the “OK” button.

The line is navigated by pressing the left and right buttons.

The up and down buttons are used to set the parameters:

• Trip direction:

- Up: Tripping occurs when the measurement is higher than the set value
- Down: Tripping occurs when the measurement is lower than the set value
- Cross: Threshold not activated

- Device serial number: The threshold is selected on one of the paired devices, or on all of them
- Value: The threshold is set in % of the sensor's SWL. When the setting is selected, the instantaneous measurement is replaced by the value in figures (in the selected unit). It is updated whenever the value is changed in %.
- Hysteresis: % of the set threshold value
- Buzzer: Activation or deactivation of the buzzer built into the product when the threshold is exceeded

The set thresholds, their values, and the activation of the built-in buzzer are visible on the main displays described in 5.5.2.

When a threshold is exceeded, the measurement becomes red and flashes on the main display.

In the case of a high threshold, the message "HIGH" is displayed intermittently.

In the case of a low threshold, the message "LOW" is displayed intermittently.

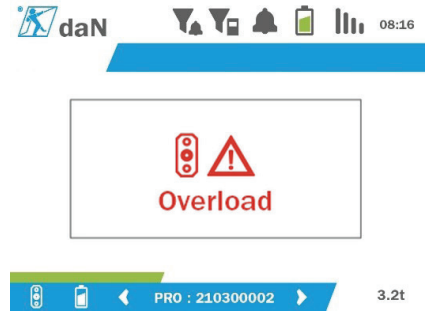
The threshold is completely reset by pressing the "OK" button when "Delete" is highlighted.

To return to the line selection, hold down (for one second) the left button. It is then possible to view the measurement of each sensor by pressing the left and right buttons.

To return to the main menu again, hold down (for one second) the left button.

5.5.13. Overload

When the force applied to the sensor exceeds its maximum capacity by more than 10% for the dynafor™ Pro and Expert models (e.g. a 1 t sensor subject to a 1.1 t load), and 30% for the dynafor™ Transmitter model, the product displays "Overload" and the built-in buzzer sounds:

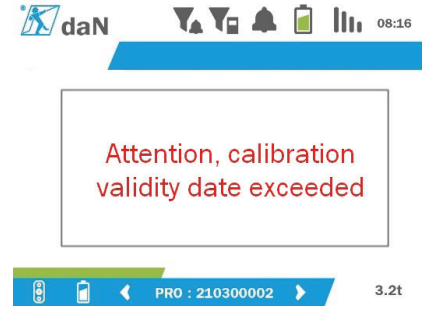


⚠ **DANGER:** In the event of an overload, it is imperative to fully release the force on the sensor and check that the product returns to zero.

⚠ **DANGER:** If the product indicates a force value when the sensor is not requested, it is because it has been permanently deformed. In this case, it is essential to have the sensor checked by the manufacturer before continuing to use it.

5.5.14. Calibration date exceeded

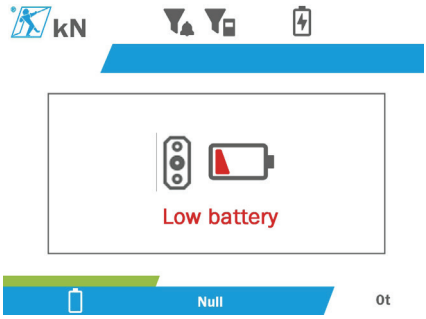
At start-up, if one of the sensor calibration dates has passed (set at one year after the last calibration), the product will display the message "Attention, calibration validity date exceeded".



Press the “OK” button to make the message disappear.

5.5.15. Sensor batteries low

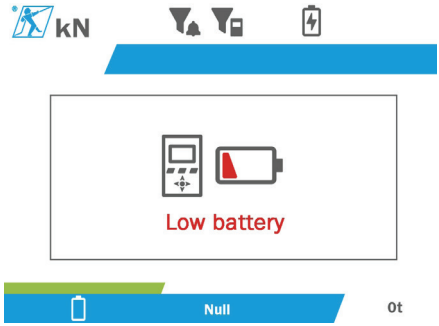
If one of the sensors has a low battery, the product will display the message “Low battery”.



Press the “OK” button to make the message disappear.

5.5.16. Display unit battery low

If the product has a low battery (20%), the product will display the message “Low battery”.



Press the “OK” button to make the message disappear.

It is advisable to recharge the product. (See 7.1.)

5.5.17. PC connection

The product can be connected to the PC to interface with the compatible software described in chapter 4. Associated equipment. Refer to the corresponding manuals.

5.5.18. Slave configuration

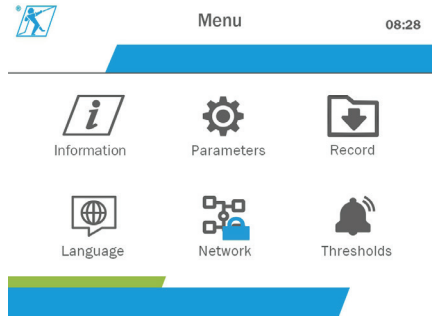
NB: There can only be one master in any configuration. Always switch on the slaves before the master. A sensor is always considered a slave.

The slave configuration mode is an advanced mode that lets you associate several display devices together, for example two dynafor™ HHD hand held devices.

The slave display device will then repeat the information sent by the master device.

To do this, switch the product to slave mode in the sub-menu Parameters – General. (See 5.5.8.2.) The product restarts on exiting the sub-menu. When the product is switched on, the loading screen shows M for Master, and S for Slave.

It is then no longer possible to pair devices on the slave device or to manage the sensor modes.



The master display unit can perform pairing (see 5.5.11.1) and will find the slave device.

The master display unit can perform the network configuration. (See 5.5.11.2.)

The slave product then displays the sensors configured on the master device.

NB: All other functions (tare, peak load and thresholds, etc.) are accessible.

NB: If the master device is turned off, the slave device will lose the connection and display “XXXX”.

NB: If the slave device is turned off and then on again, it will display “XXXX”. The assembly of products (slave(s) then master) need to be reinitialised.

NB: If a slave device is switched off, the master device is not affected.

5.6. Turning the product off

To turn the product off, press and hold the on/off button for three seconds without pressing too hard.

NB: Turning off the product does not cause the sensor to switch off.

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5.7. Uninstallation of the associated sensor(s).

When deinstalling the sensors, make sure that all tensile forces have been removed beforehand.

Clean the product and store it according to the chapters 7.2. Autres vérifications and 8.Transport et stockage

6. Prohibited uses

THE FOLLOWING ARE FORBIDDEN:

- Modifying the product.
- Exposing the product to any electric and/or electromagnetic shock.
- Disassembling or opening the product.
- Using the product for operations other than those described in this manual.
- Using the product in a highly corrosive environment.
- Using the product in an explosive environment.
- Using the product outside the temperature range of -20°C to 50°C.
- Using the product if it does not appear to be in good condition.
- Using the product if the markings are missing or illegible.
- Using the product with sensors and accessories other than those specified by Tractel® in this manual.

See also the prohibited uses in the manuals associated with the sensors and other accessories.

7. Maintenance and periodic check

7.1. Recharging the battery

A warning message is displayed on the hand held device. Proceed to recharge the battery:

- Either using the charger and its cable supplied with the product;
- Or with a power device with USB type A (PC, external battery), using the USB C to A cable supplied with the product.

IMPORTANT: The battery can only be replaced by Tractel® or an authorised repairer in the event of a malfunction.

Characteristics of the battery: Lithium battery, brand ENIX, LP906090 6,000 mAh 3.7 V

7.2. Other checks

Tractel® recommends periodically inspecting the visual condition of the product and cleaning the product regularly with a dry cloth.

8. Transport and storage

During storage and/or transport, the product must be:

- Placed in its original packaging or in the designated position of the sensor case.
- Stored in a dry location.
- Stored at a temperature between -20°C and 60°C.
- Protected from chemical, mechanical or any other type of attack.

9. Product disposal and environmental protection

The product must be disposed of in accordance with the regulations applicable in the country of use.

The product complies with the requirements of the REACH regulation and the RoHS directive; it is not covered by the WEEE directive.

The different product components must be recycled on the basis of the table below, after separating metal and synthetic materials. These materials must be recycled by specialised organisations.

At the time of disposal, only trained individuals may dismantle the product to separate its components.

Component	To be treated as a waste of the type
Housing (plastic)	Ordinary waste
Printed circuit board and display unit	Electronics
Battery	Accumulator

10. Technical specifications

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Model		HHD
Number of sensors at input		4 maximum
Display size	mm	13 mm over a single-sensor main screen
Battery life	h	48
RF (radio frequency) technology		2.4 GHz – 2,4835 GHz owner, range up to 400 m in open air
RF radio power output	dBm	9.5
Weight	kg	0.45
IP rating		IP65
Operating temperature	°C	-20 °C to +50 °C
Display unit material		ABS V0
Batteries		Rechargeable battery, ENIX, LP906090 6,000 mAh 3.7 V
Charger		MK-Q181EX charger
Dimensions (see figure 4 and 5)		
Height	mm	149.3 product / 152.5 hull
Width		95.3 product / 105 hull
Depth		26.6 product / 40 hull

11. Regulations and standards

11.1. Charger

The charger included in the delivery complies with:

European standards

Directive 2014/30/EU

Reference of standards:
EN 55032:2015
EN 55035:2017
EN 61000-3-2:2014
EN63000-3-3:2013
EN62368-1 2014+A11:2017

International standards

UL62368-1:2014 Ed. 2
CSA C22.2#62368-1:2014 Ed. 2
47 CFR FCC Part 15 Subpart B:2017
ANSI C63.4:2014
AS/NZS 62368.1:2018
AS/NZS 3112:2017
AS/NZS CISPR 32:2015

11.2. Battery

The battery included in the product complies with:

International standards

IEC62133-2:2017
UN38.3

11.3. HHD display unit

Device full protected by double or reinforced insulation.

The product described in this manual complies with the following:

European standards

Directive 2014/53/EU (RED)

Reference of radio standards
EN300440 V2.1.1
EN300328 V2.2.2
ETSI 203367 V1.1.0

Reference of health standards
EN62479 (2010)

Reference of EMC standards
EN61326-1 (2013)
EN301 489- 1 & 17

Reference of electrical safety standards
IEC/EN61010-1 (Amd 1 Ed. 3)

Australian and New Zealand standards

Reference of electrical safety standards
AS/NZ61010-1

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Russian standards

Reference of EMC and electrical safety standards
Technical regulation CU TR 020/2011

International standards

IEC 61326-1 Ed.2: 2012
IEC 61311: 2007
American and Canadian standards:

Reference of radio standards:
FCC part 15 Radio Frequency Devices Subpart C Intentional Radiators
RSS-GEN & RSS-210 Low power licence-exempt Radiocommunication devices

Reference of EMC standards
FCC Part 15 Subpart B - Information Technology Equipment
ICES-003 Information Technology Equipment

NB: This equipment has been tested and deemed to comply with the limits for a class A digital device, pursuant to section 15 of the FCC regulations. These limits are designed to provide reasonable protection against harmful interference when the equipment is used in a commercial environment. This equipment generates, uses and can emit radio waves, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operating this equipment in a residential area is likely to cause harmful interference, in which case the user must eliminate the interference at his or her own expense.

NB: This device complies with Industry Canada's RSS applicable to licence-exempt radio apparatus. The equipment may be operated under the following two conditions: (1) it must not cause any interference, and (2) the user of the device must be prepared to accept any radio interference received, even if such interference is likely to affect the operation of the device.

In accordance with Industry Canada regulations, this radio transmitter may be operated with an antenna of a type and a maximum (or smaller) gain approved for the transmitter by Industry Canada.

To reduce the risk of radio interference for other users, the type of antenna and its gain should be chosen so that the equivalent isotropic radiated power (e.i.r.p.) does not exceed the intensity required to establish satisfactory communication.

12. Troubleshooting

Problems	Possible causes	Remedies
"XXXX" display	Sensor batteries empty	Replace the batteries.
	Defective electronics.	Contact Tractel®
	Sensor off or in sleep mode	Switch off the display unit, switch the sensor off then back on, then the display unit
	No communication between the sensor and display unit.	Check the network configuration.
" -____- " display	Sensor compressed or twisted	Remove the compression force
	Negative gauge bridge imbalance	Contact Tractel®

For any other issues related to the sensors, see the manuals.

13. Declaration of conformity

Copy of the declaration of conformity in the appendix